ams

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PIMEX USER MANUAL
for
the ALUMINIUM PLANTS
in
the AMS COOPERATION

Photo: Dagfinn Kroslid, Alcoa Lista

PIMEX PROCEDURE

PIMEX stands for picture mixed exposure i.e. pictures/shots simultaneously with exposure measurements. The software is used to film selected working operations simultaneously with measurement of exposure.

The PIMEX instrument consists of a sender and a receiver that transfer measurement figures telemetric to the computer.

The software PIMEX2008 is to be installed on a laptop with Windows XP, SSD hard disk, minimum 2GB RAM, minimum 2 USD plugs and sufficient battery capacity. See enclosed equipment list about recommended laptop. The software connects film together with results of measurements.

The camera is connected to the receiver which is connected to the laptop via 2 USB cables (1 for transmission of measurement figures; DATA, and 1 for transmission of video; VIDEO). When recording, the film is stored in the laptop and not in the camera. The camera is used to film working operations. (It is not necessary to store the video in the camera.)

Censors are connected to the sender. Censors measure exposures for working operations. Censors and sender are carried by the operator preferentially in a rucksack at the back and hoses/cables are place over the shoulder and fitted in the inhalation zone of the operator.

For installation and adjustment of laptop, see **Installation of PIMEX2008**.

Solutions to carry the receiver, laptop and camera may differ. Here illustrated by 2 examples, 1 waistcoat and 1 with bicycle.

Waistcoat

Place the laptop in front of waistcoat, secured by burdock lock. PIMEX receiver is to be place at the back in the waistcoat. Cables are secured in the shoulder strap of the waistcoat.

Photo: Sør-Norge Aluminium

Bicycle

Photo: Dagfinn Kroslid, Alcoa Lista

To start a measurement, see **Start of recording / filming**.

Immediately after recording, the results may be shown from the laptop (**Overview**). Yellow marker is moved in **Overview** to show certain exposure situations.

Showing of PIMEX films can be done like this:
2 solutions for how to show – normal size or P1, see **Open file** and **Overview** in **Adjustment of PC**.

Preparation and editing of film is done in an editing software, see **Edit film**.

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UtstyrslistePIMEXseptember 2010 (Equipment list PIMEX September 2010)

INSTALLATION OF PIMEX2008

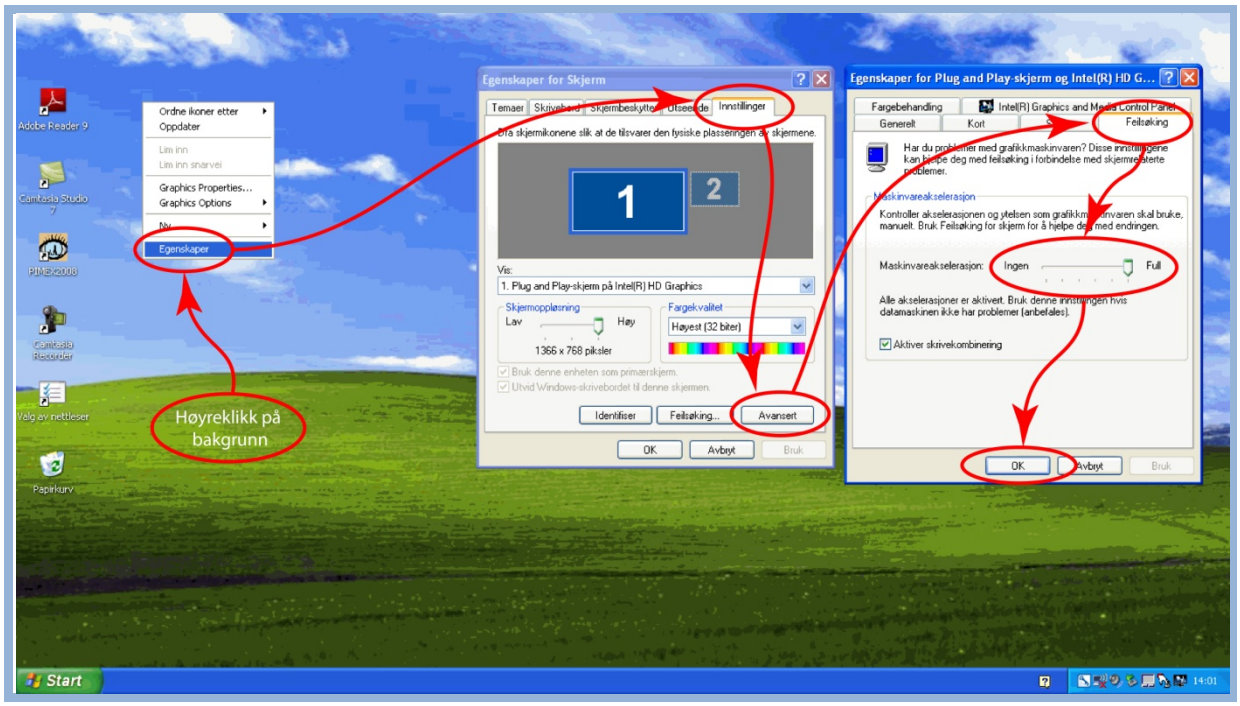
The software is to be installed at a PC with the plat form Windows XP.

Before installation of the software the settings for region and language must be done, adjust regional setting, period is chosen as decimal sign.

The software is to be installed in the catalogue for program files.

ADJUSTMENT OF PC

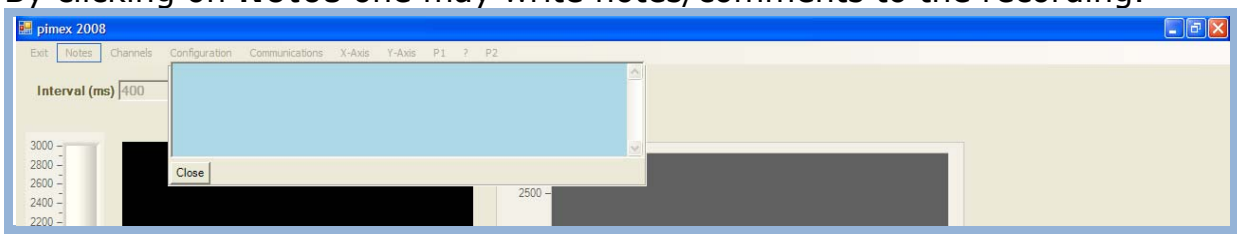
Before the software is opened at the PC for filming, check that hardware acceleration is on full. When filming is finished, the hardware acceleration is to be changed to none (see picture below).



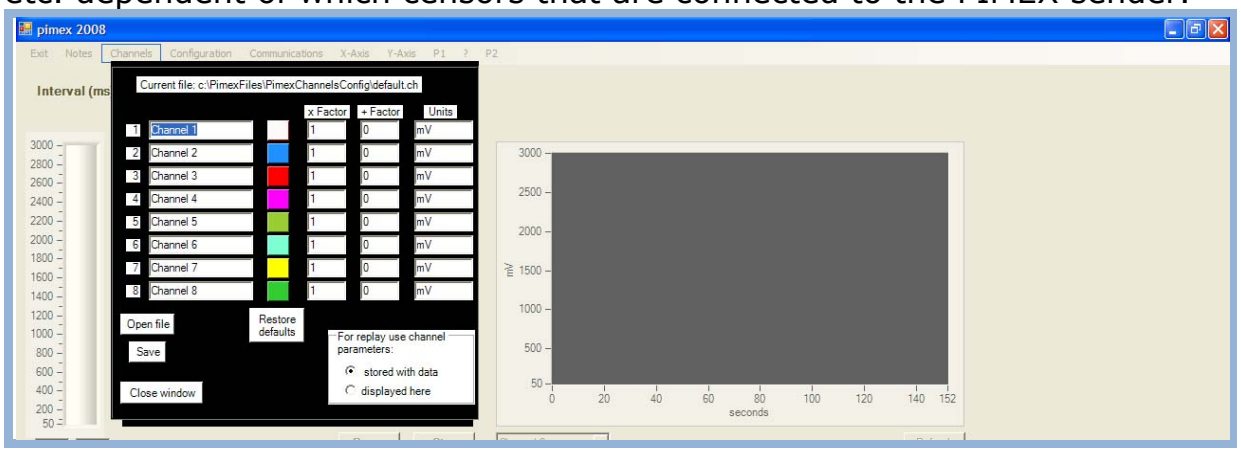
Start the software (click on the symbol for PIMEX2008 at the desktop).

Adjustment before filming

By clicking on **Notes** one may write notes/comments to the recording.



Before filming is started, channels must be defined. Only censors with direct analogue mV outlet may be used. Click on **Channels** and type the name of the censors for instance HF in channel 1, humidity in channel 2 and dust in channel 3 etc. dependent of which censors that are connected to the PIMEX sender.

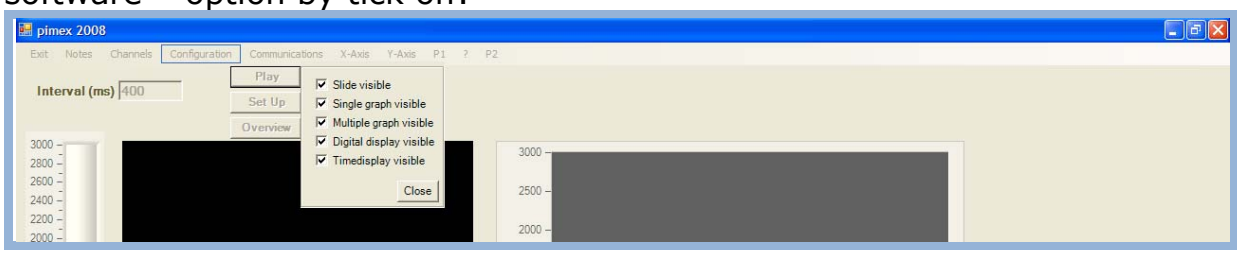


Below **Units** is defined which measurement unit that is factory set (calibrated) for each sensor - mg/m^3, ppm, percent. Since PIMEX stores mV signals, one must use transformation ratio to convert back to concentration units. The method for this is described in the calculation sheet (Sette_opp_signal.xls). Follow the instructions in the calculation sheet. It is important to remember that the measuring instruments (censors) often have their own setting at its analogous outlet. Often one may define which concentration that shall give 0 mV and which concentration that shall give 5 mV. It is important to have control on this since the factors that shall be used in the calculation sheet, are dependent on this. It is also important to adjust the measuring area in the instrument to the concentrations one has in the different situations, so that one has the best available resolution of the signal.

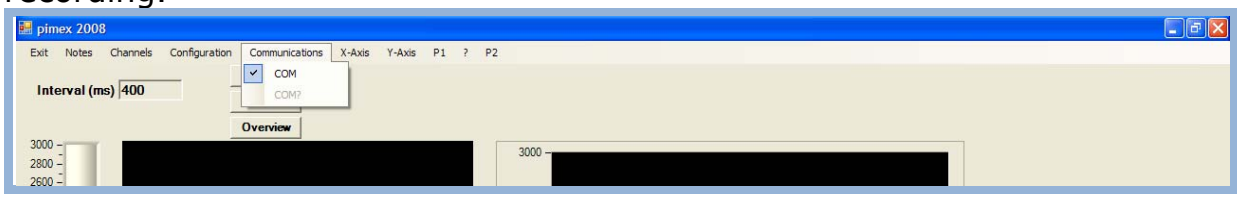
Sette_opp_signal.xls

The file is opened from the appendix list in this document (when clicking on the paper clip in the window the document list is displayed).

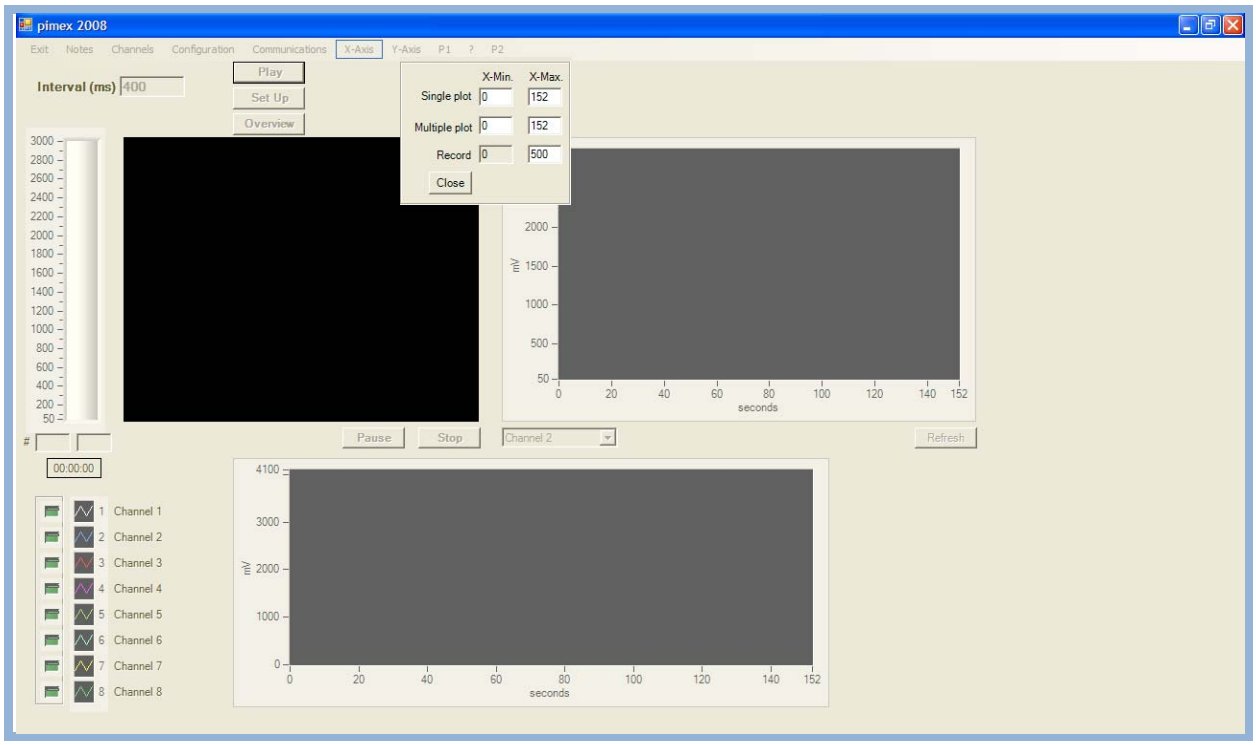
The picture **Configurations** makes it possible to define what to be shown in the software – option by tick off.



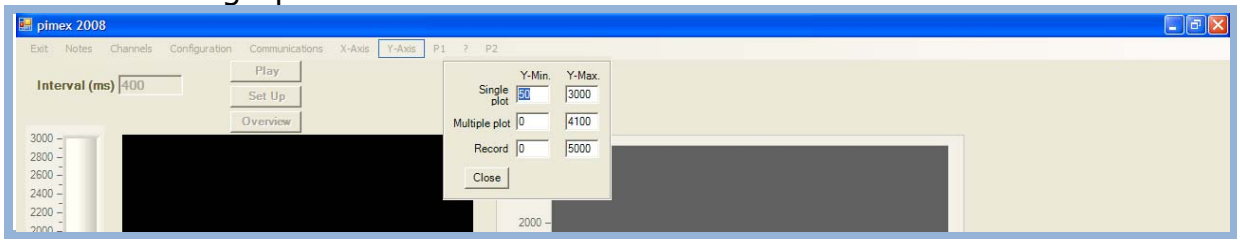
In **Communications** tick off on **Com** (see picture below) before start of recording.



X-Axis is defined with the period of time that is to be shown in the graph. When recording, this axis will automatically move while the measurement is accomplished.
Single plot is the graph to the right (window B) where the signal from only one channel is shown. From the navigation bar below the graph, one may chose which channel that shall be shown.
Multiple plot (window C) is the graph in the bottom where signals from all chosen channels will be shown.

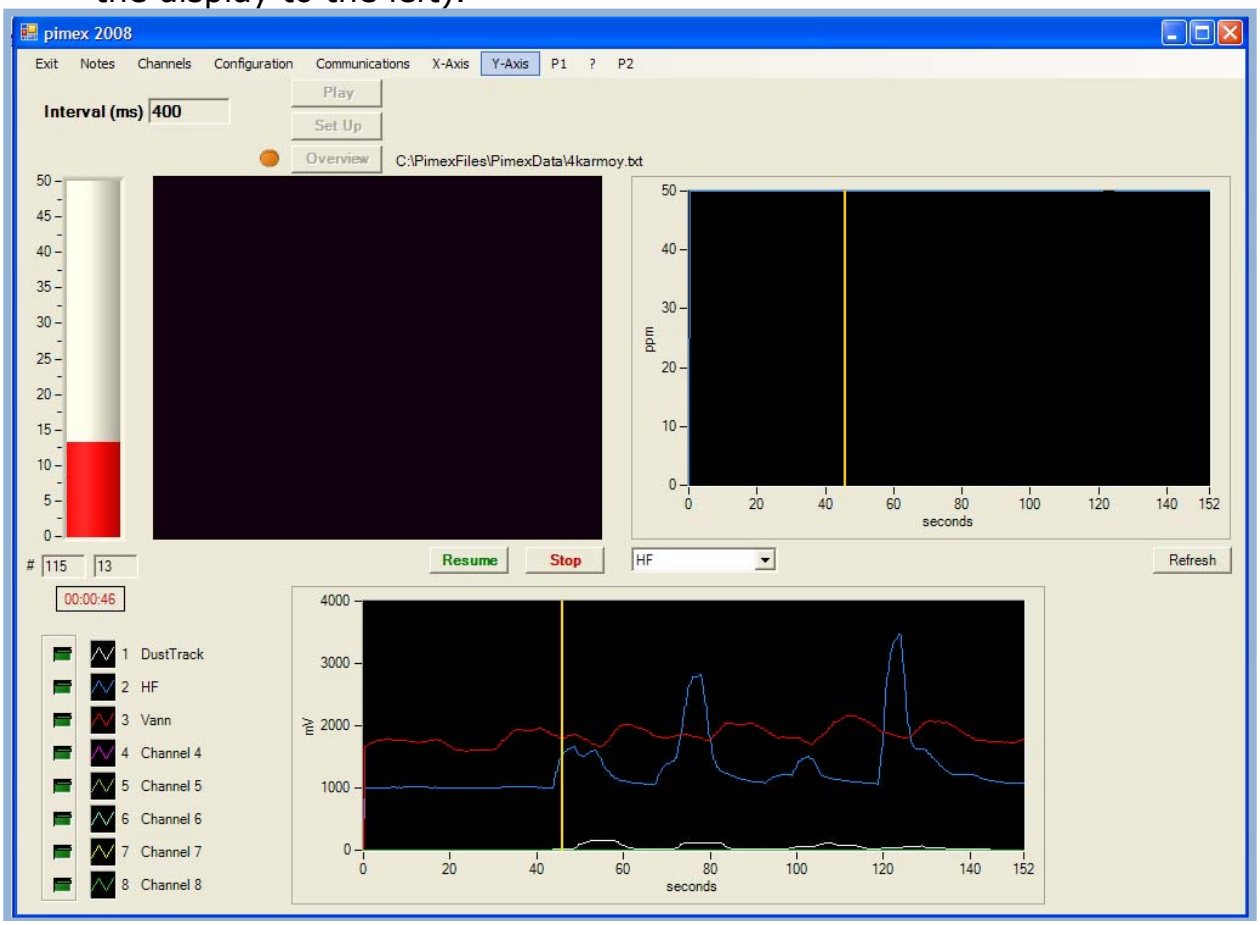


Y-Axis is defined with values for the measurements that are selected to be shown in the graphs.

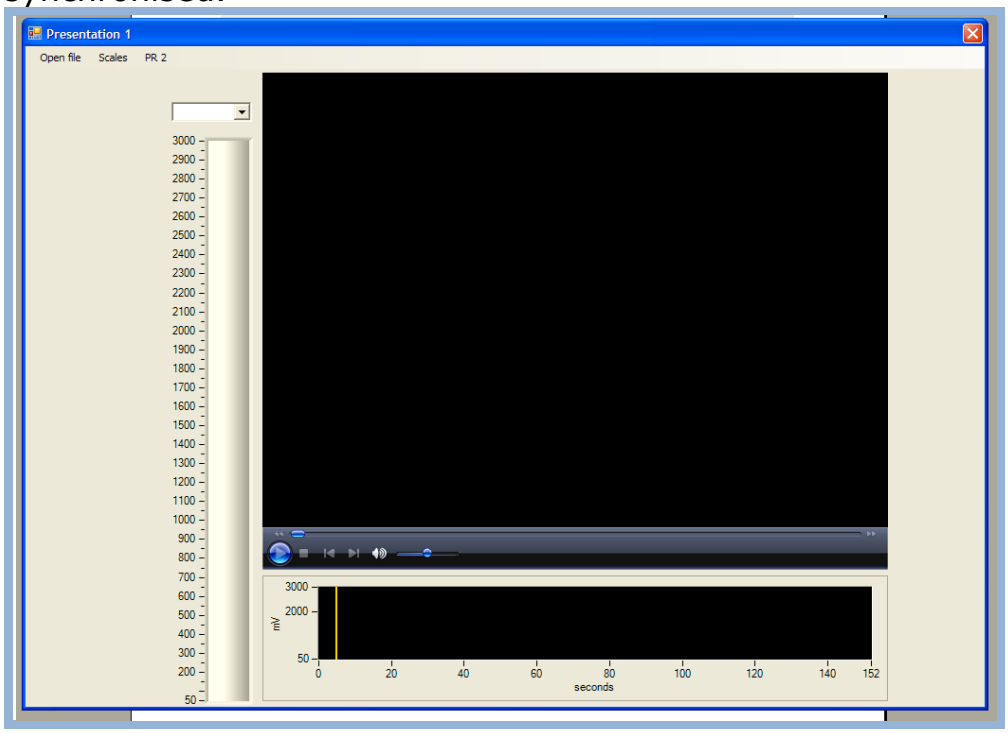


Picture below shows a general view of the software. Shown information is:

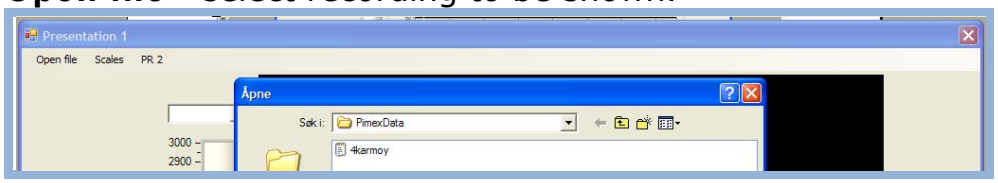
- Column – the column indicator shows real concentration.
- Window A (to left) – shows recording.
- Window B (to right) - **Single plot** shows signals from the instrument after the actual calibration factor is used (see **Channels**).
- Window C (in the bottom) - **Multiple plot** shows mV signals (raw signals) from all the actual channels (those channels that are marked with green in the display to the left).



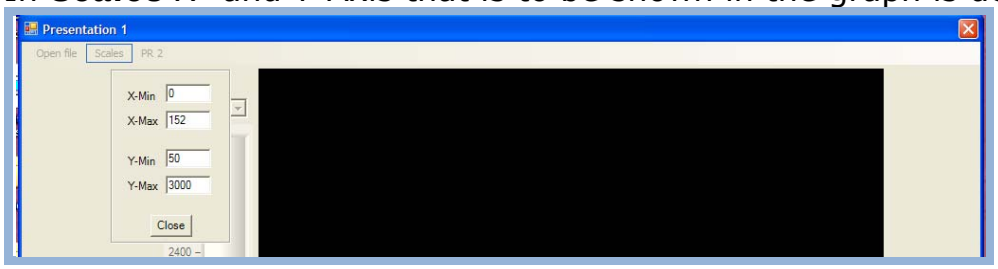
P1 means **Presentation 1** where recording is shown (large window), exposure progress for a definite exposure factor and column for exposure value synchronised.



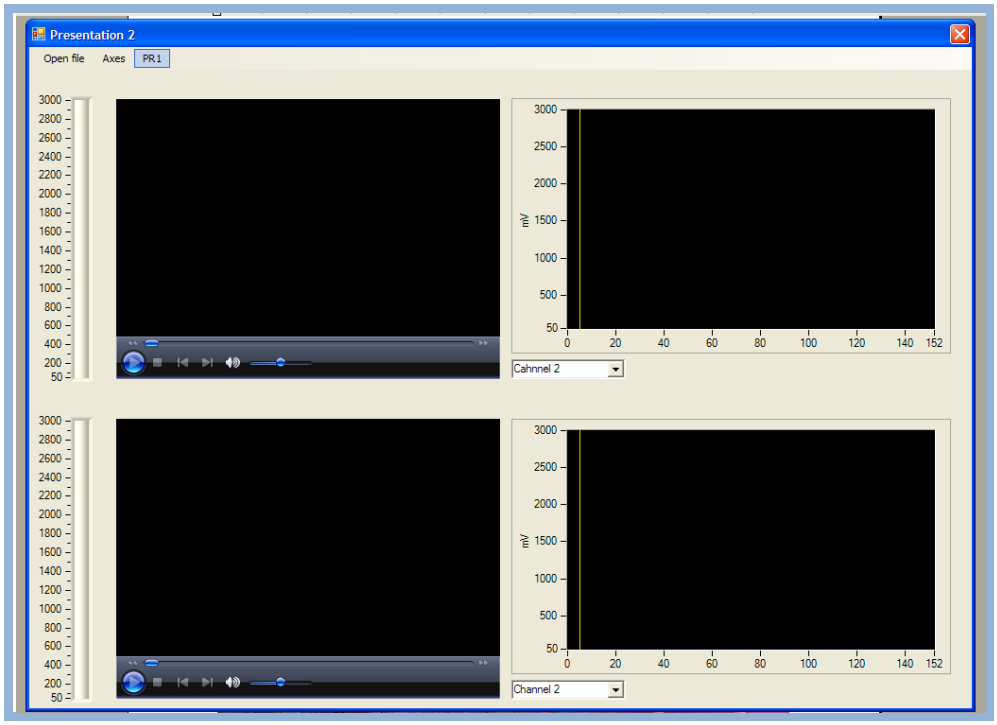
Open file - select recording to be shown.



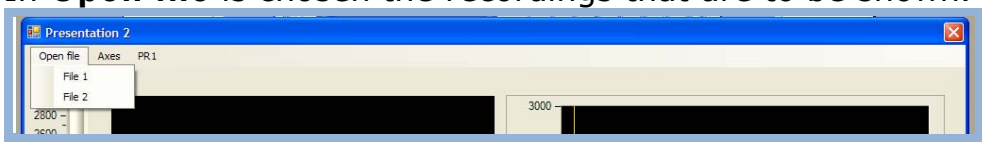
In **Scales** X- and Y-Axis that is to be shown in the graph is defined.



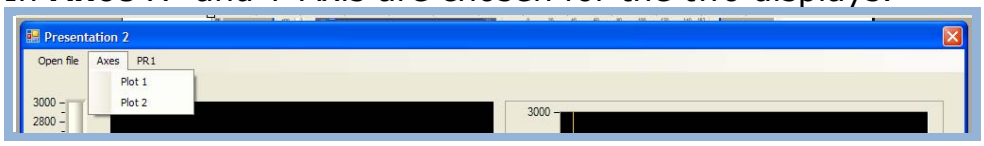
PR 2 means **Presentation 2**. Here one may show different exposure progress simultaneously. During the graph progress one chooses the exposure factor one wants to show.
By the navigation bars below the graphs one may choose which exposure one wants to show.



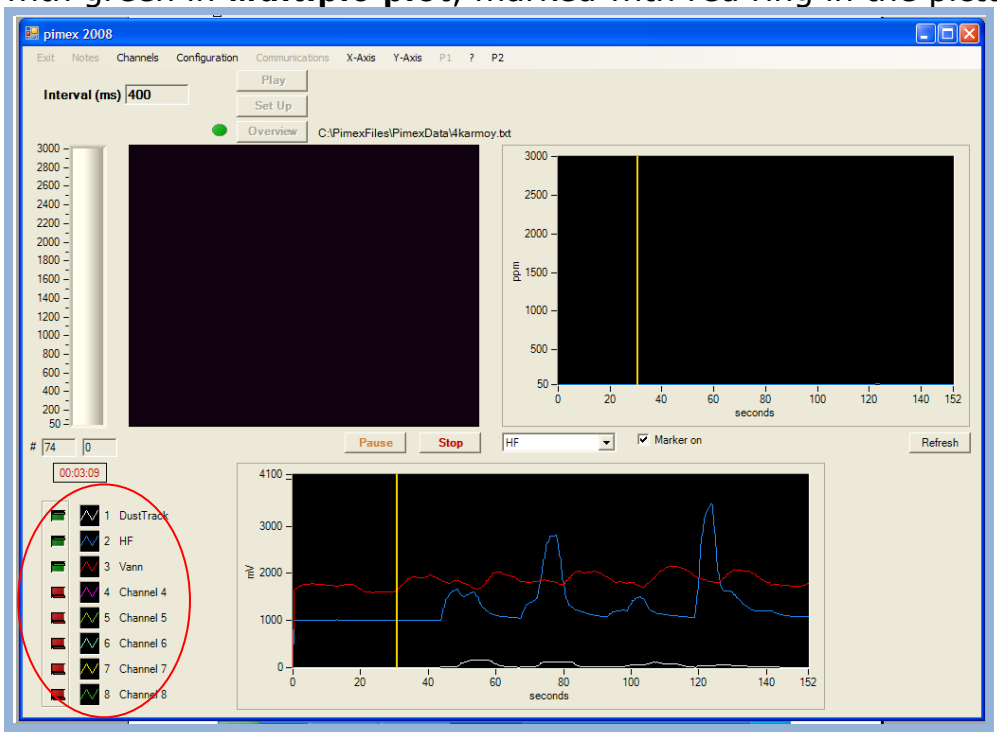
In **Open file** is chosen the recordings that are to be shown.



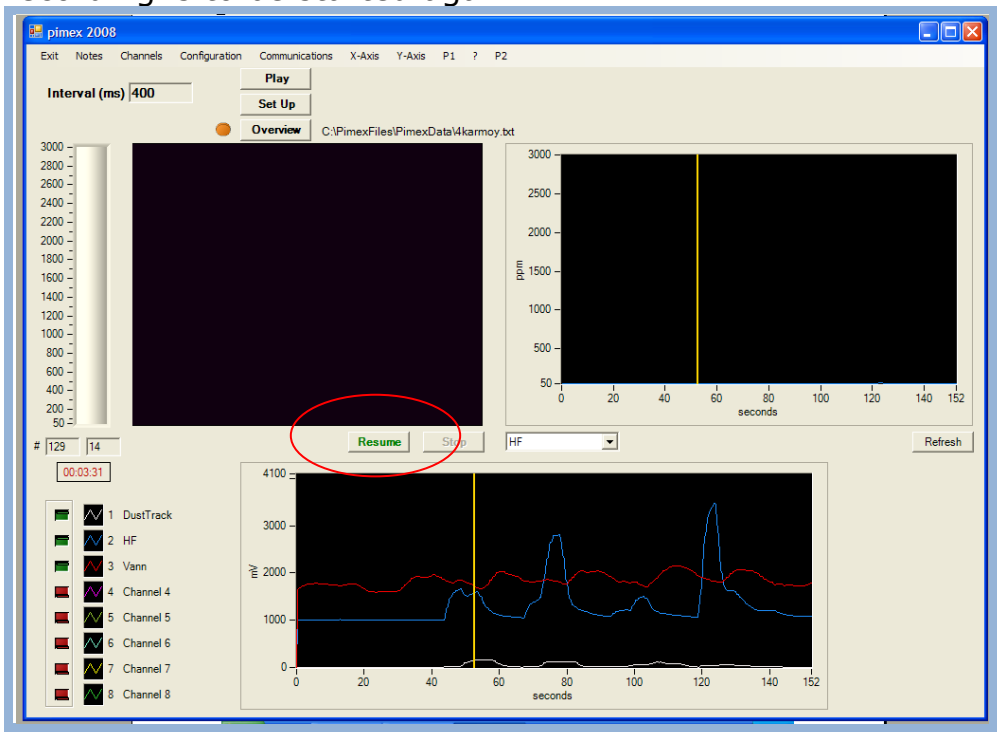
In **Axes** X- and Y-Axis are chosen for the two displays.



When showing films one may choose **Play** or **Overview**. **Play** shows recording and exposure progress continuously in the same way as when the recording is executed. **Overview** is more practical to use since one then gets the whole exposure progress and may freely pause, stop or move in the recording (yellow marker) to actual exposure situations. One may choose which exposure one wants to show in **Single plot** of the actual exposures (those that are marked with green in **Multiple plot**, marked with red ring in the picture below).



If one wants to move the yellow marker in the graph, the recording must be stopped by clicking on **Pause**. Then the yellow marker may be moved forth and back in the graph. Click on **Resume** (in red ring in the picture below) when the recording is to be started again.



If one is not getting the whole graph progress in **Single plot**, the scale for the Y axes may be wrong. One must then change the Y axes to the correct value and click **Refresh** (right hand side). The data will then be picked up with new settings on the axis.

Before a recording is started, all batteries must be fully charged.

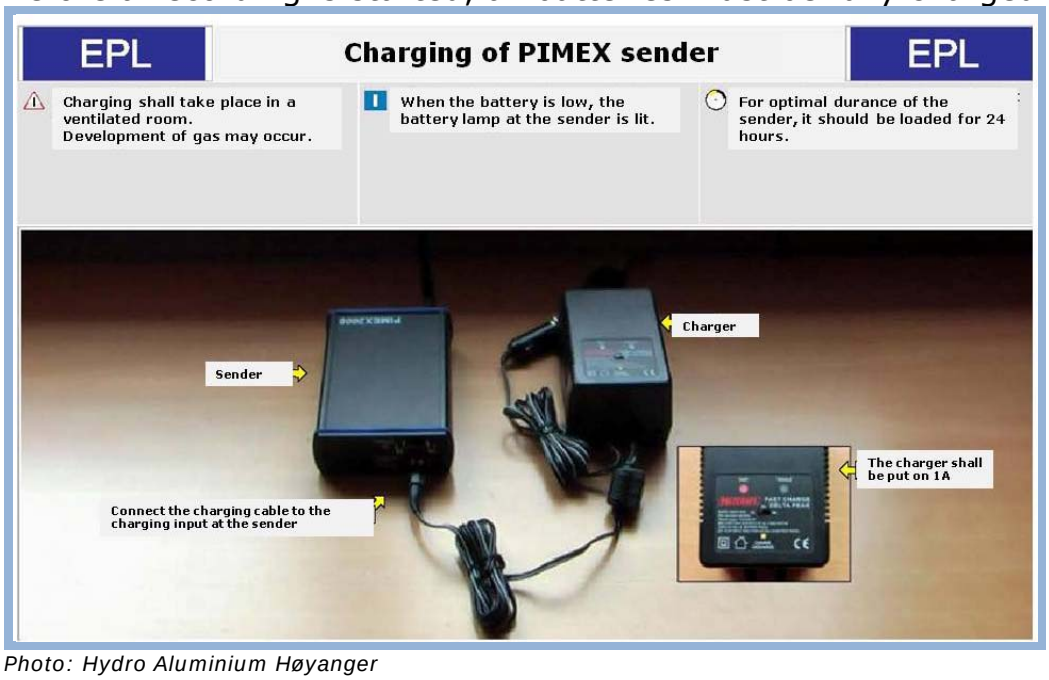

EPL
Charging of PIMEX sender
EPL
Charging shall take place in a ventilated room. Development of gas may occur.
When the battery is low, the battery lamp at the sender is lit.
For optimal durance of the sender, it should be loaded for 24 hours.
Charger
Sender
The charger shall be put on 1A
Connect the charging cable to the charging input at the sender

Photo: Hydro Aluminium Høyanger

Fitting of PIMEX receiver and camera to laptop

Fit audio/video cable to PIMEX receiver according to colour code.
Fit audio/video cable to camera.

Photo: Sør-Norge Aluminium

Fit both USB cables between PIMEX receiver and laptop (marked A and B). Often it is rational to mark both the computer and the USB cables so that one always uses the same USB inlet at the computer to data and video. This increases the possibility for that the USB inlet finds the correct driver for video and data that again reduces the risk for communication disorder between the receiver and the computer.

Photo: Sør-Norge Aluminium

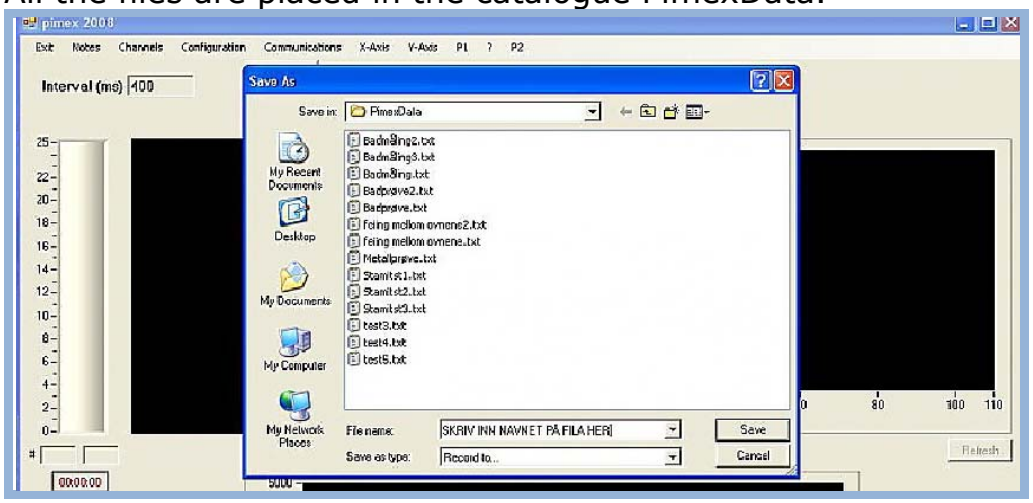
Start of recording / filming

Setup

Define which inlets that will be used. By clicking on **Setup** the software search for the equipment that is connected.

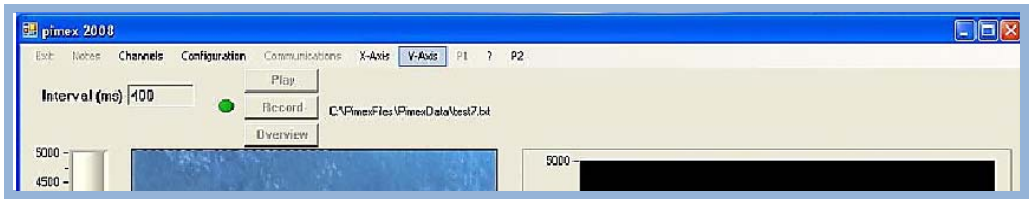
Where to save the files?

All the files are placed in the catalogue PimexData.



Record

When all censors are connected to the sender and corresponding channels are defined, the filming may start by clicking on **Record**. During record the green light is lit. Recording is stopped by **Stop.** Instead of using **Pause** and **Resume** during recording, it is recommended to stop and start a new recording afterwards.



Interval for sampling is 400 milliseconds (fixed). That means that for each 0,4 second a new value is registered in the PIMEX software.

It is totally 4 censors (4 channels) that may be connected to the PIMEX sender at the same time. The HF monitor needs 2 channels, 1 for HF gas and 1 for humidity. The software has possibilities for 8 channels, but only 4 channels are used in the sender.

EXAMPLE OF EQUIPMENT

Photo: Sør-Norge Aluminium

1. Suitcase to DustTrak.
2. Measuring hose, 0 point calibration and tool to DustTrak.
3. Rucksack to DustTrak and sender (used by the operator).
4. Charger to PIMEX sender.
5. PIMEX sender with cable (for connection of censors). Serv. No. 2010 (example) 7,2 V DC. NB! PIMEX receiver must have same number.
6. DustTrak. Aerosol monitor Model 8530. Batch No. 8530 101714 (example).
7. Charger to DustTrak.
8. Film rack (tripod for stationary filming and monopod for filming when moving).
9. Hard disk (back-up).
10. Handbag to PIMEX PC.
11. PIMEX PC. Dell Latitude E 6510 (SSD-HD).
12. Handbag to PIMEX PC.
13. 2 USB cables connected between PIMEX PC and PIMEX receiver.
14. PIMEX receiver. Serv. No. 2010 (example). NB! PIMEX sender must have same number. PIMEX receiver gets power from PC.
15. Video camera. Canon Legerie HF R17 (example).
16. Audio/video cable is connected between PIMEX receiver and video camera.
17. Extra video battery.
18. Charger to video camera.
19. Network cable.

CENSORS

Follow description in the user manual for each censor. Description and fitting towards PIMEX for some censors is found in appendixes. The files are opened from the appendix list in this document (when clicking on the paper clip in the window the document list is displayed):

Appendix 1 – DustTrak I
Appendix 2 – DustTrak II
Appendix 3 – HF monitor

EDIT FILM FOR SHOWING OF SELECTED SECTIONS

Check that hardware acceleration is turned off (none).
Start the PIMEX2008 software. Click on the **Overview** button and choose film. Press **Pause**. Before editing of film place **Y–Axis Single plot Y-Min** to 0 and **Y-Max** to highest shown graph. Set **X-Axis Single plot X-Min** to desired minimum area. Set **X-Max** to desired maximum area. Draw the yellow marker to desired start point.

Start editing software, here as example by:

CAMTASIA RECORDER

Start the software Camtasia Recorder. Click the arrow besides the **Custom** button. Choose **Select area to record** and mark the desired record area. Click **Rec** at Camtasia Recorder. Start the PIMEX2008 recording (click **Resume**) within 4 seconds (countdown in the software). One may now directly edit the film by clicking on **Pause** both in PIMEX2008 and Camtasia Recorder. Move the yellow marker to desired start and click **Resume** in both programmes. When desired recording is completed, click **Stop**. Click **Produce**, save the film in the catalogue Camtasiavideo with file name describing the working operation. Choose **Custom production settings** and click next, choose the format **WMV** (windows media video), click next, click next and click next, next and next, click **Complete/Finish**. The film will now be prepared. It will take some time. The film is now stored as **WMV**. Click **Complete/Finish**.

FAULT FINDING

Fault/symptoms	Reason	Action
PC/Screen gets black	Strong magnetic fields	Move and restart the PC.
Video window disappears when one uses the video editing software	Hardware acceleration is on full	Deactivate hardware acceleration to none.
Measuring signals disappear	Loose connections	Control all connections. When burst in the signal cable – contact STAMI. Control air hose to DustTrak.
Equipment does not function	Discharged equipment	Charge after use.
Black/white picture in PIMEX software	Defect RGB cable or bad contact	Control whether the cable is properly fitted. If this does not help, change cable.
Video picture miss at PC or the picture is in grey	Error in the software	Control whether old recordings may be played back. If yes: retry. If no: reinstall the software at the laptop.
The exposures hang after the video	Low battery at the sender	Charge sender.
Backlight at LED screen turns of	PC too near flexible – strong magnetic fields	Move longer away from the magnetic fields and start the laptop again.
No contact between sender and receiver	Discharged sender	Charge sender.
Optics at the camera fails	Too strong magnetic field	This is dependent on type of camera. For some cameras magnetic protection must be fitted. Best to choose camera that can take magnetic fields.
Sender is burned	Sender has charged at 3 ampere	Order new and install drives again.
When starting the PIMEX software the following error: Conversion from string ”154.7496875” to type ‘Double’ is not valid.	Wrong installation of the decimal punctuation mark in PC	Installation in Windows: Settings for region and language Adjust regional settings Number Decimal punctuation mark: choose single stop ‘.’
Cutting of graphs in **Single plot**	Wrong settings of signal before recording	Change settings at the measuring instrument and in **Channels** before new recording.
Cutting of graphs in **Single plot**	During playback the signals are left out	Wrong setting at Y axis. Change Y axis and click **Refresh**.